

# Materials and Processes

Mr. Warning  
End Table & Coffee Table

## Goal:

Upon completion of this project each student will be able to safely and successfully use all necessary lab equipment needed to build either an end table or a coffee table from rough sawn lumber.

## Objectives:

Throughout the course of this project, students will complete the objectives listed below in the order they are listed.

- Lab Safety
- Clean-Up Assignment
- Machine Safety
- Accurately Measure to the nearest sixteenth of an inch
- Understand purpose of a Bill of Materials
- Develop a Plan of Procedures
- Stock build-up
- Squaring a Board Process
- Develop effective time management with lab equipment
- Understand different wood joining techniques
- Sanding procedures
- Staining procedures
- Finishing/Spraying techniques
- Hand Power Tool Operation
- Assembly procedures
- Plan of Procedures Manual

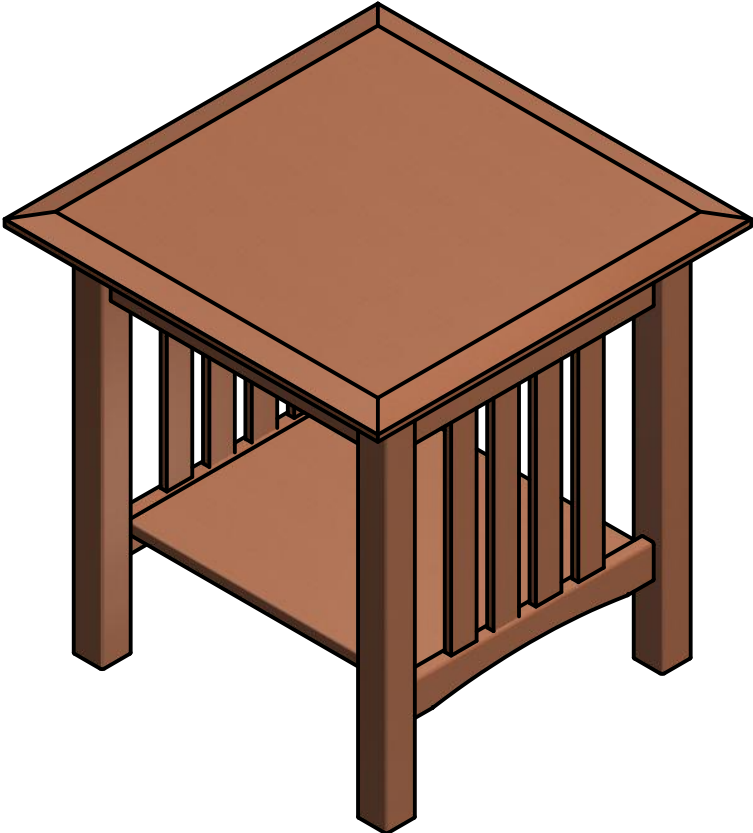
## Students Handouts:


- End/Coffee Table Blueprint
- Bill of Materials
- Router Procedures
- Worksheets related to Hand Power Tools
- Plan of Procedures Checklist

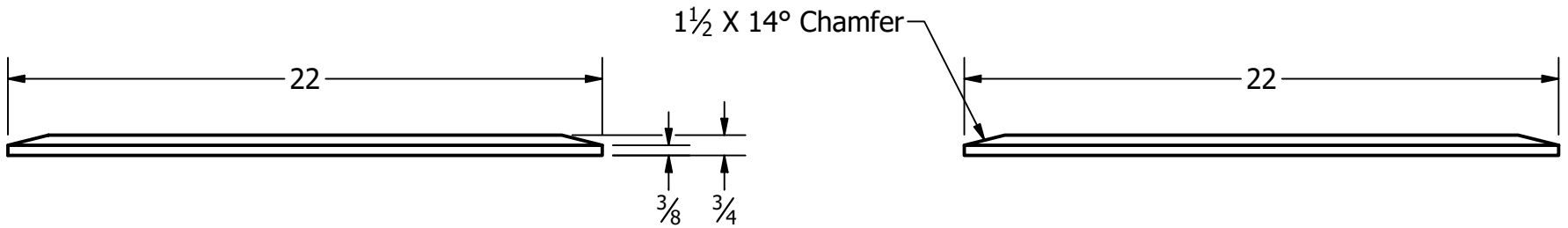
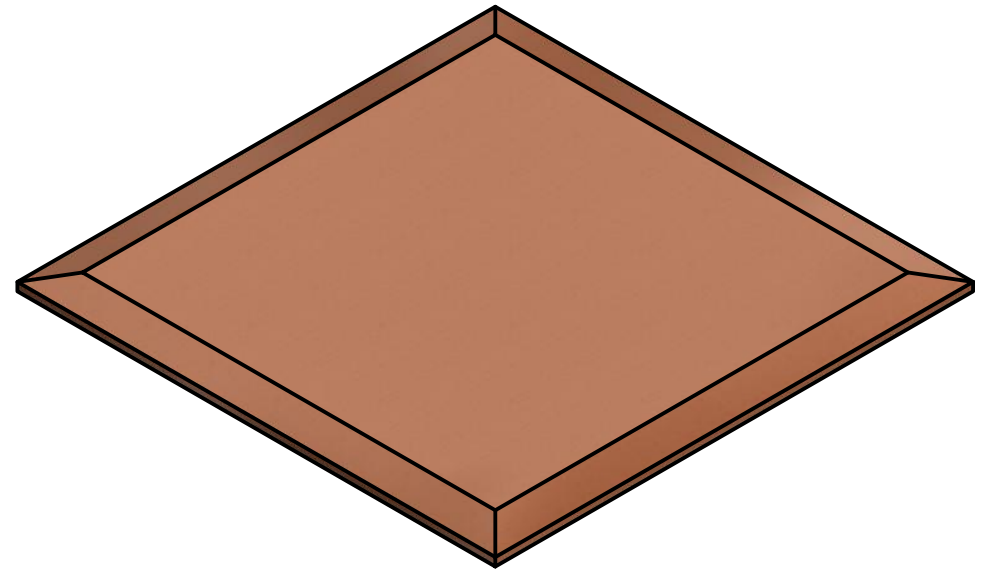
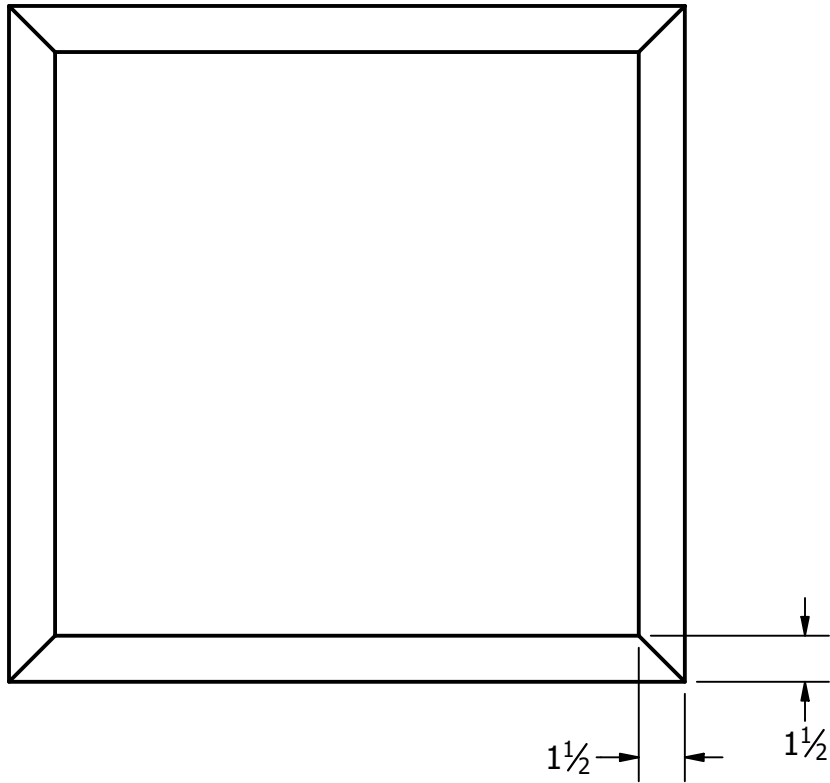
## Assessments:


- Individual Parts Evaluation
- Plan of Procedures Scoring Rubric
- Table Evaluation Rubric

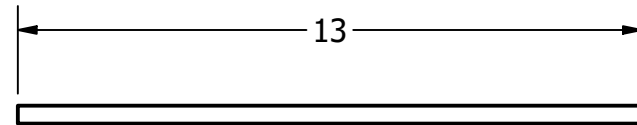
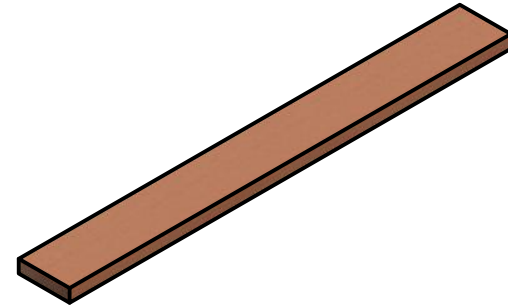
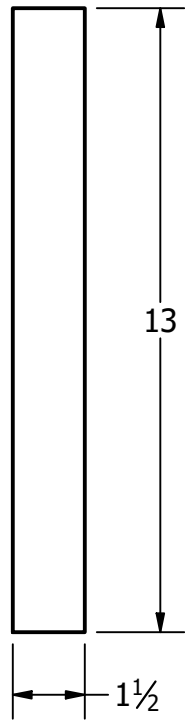





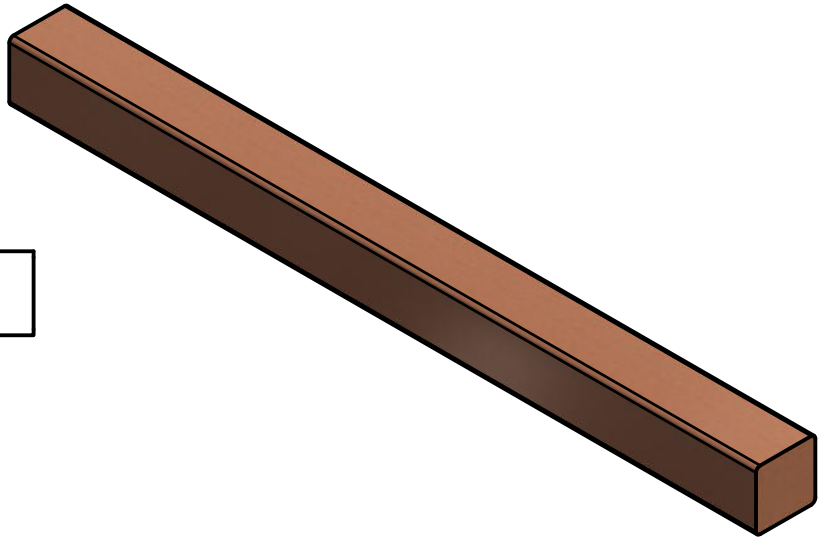
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AUTHOR		INTRODUCTION TO ENGINEERING DESIGN	DATE 11/22/2010	1 OF 8	



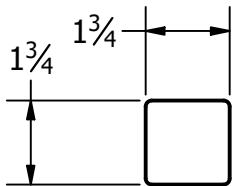
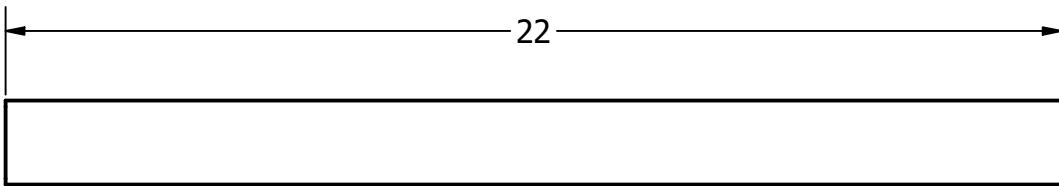
TITLE	End Table Top	BONDUEL HIGH SCHOOL	SCALE	HOUR	
AUTHOR	Mr. Warning	INTRODUCTION TO ENGINEERING DESIGN	DATE 11/22/2010	2 OF 8	



TITLE	Slat	BONDUEL HIGH SCHOOL	SCALE 1:1	HOUR	
AUTHOR	Mr. Warning	INTRODUCTION TO ENGINEERING DESIGN	DATE 11/22/2010	3 OF 8	



All Fillets are .125"



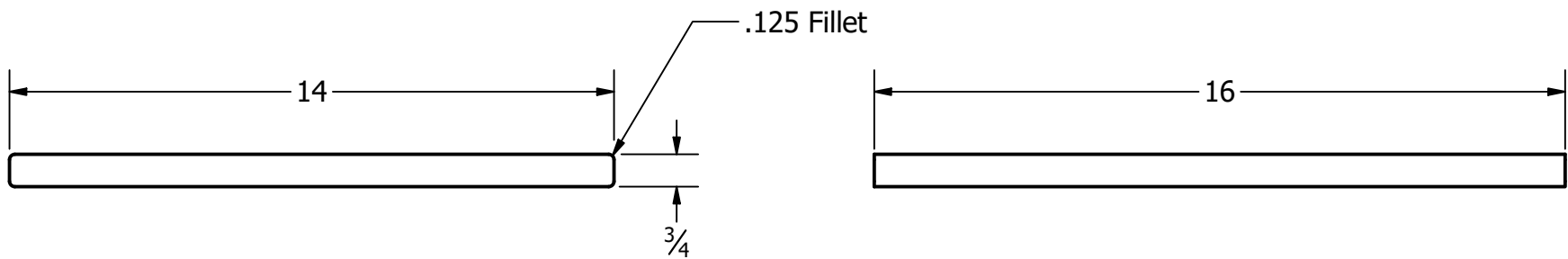
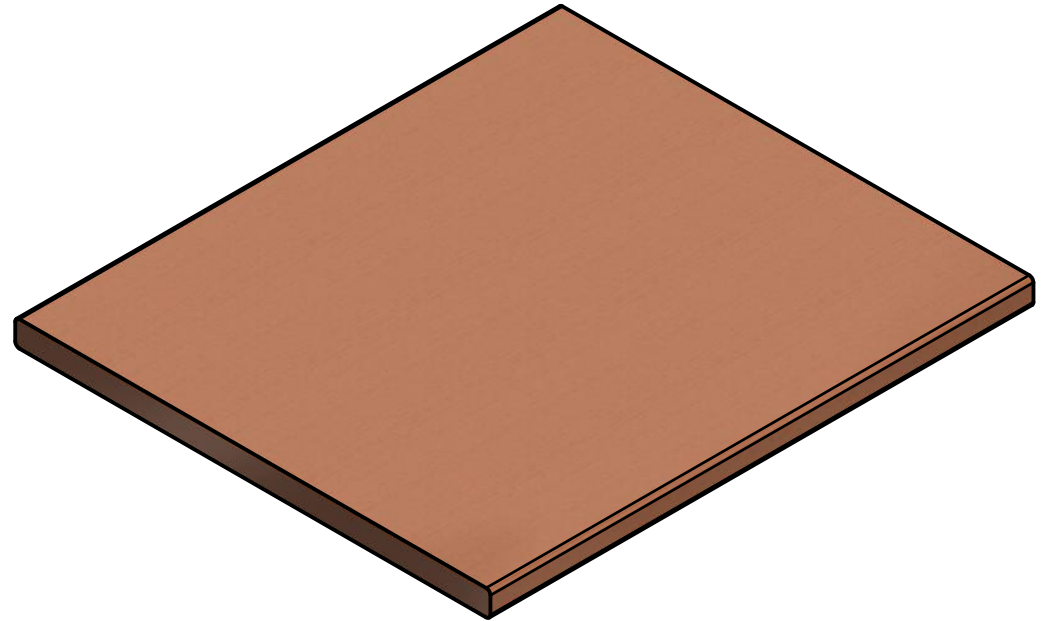
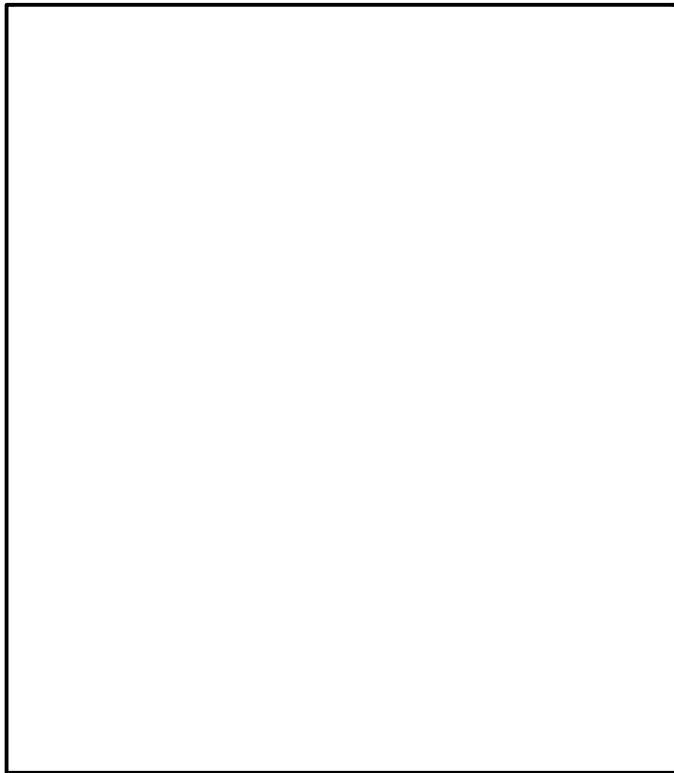
TITLE	Leg
AUTHOR	Mr. Warning


BONDUEL HIGH SCHOOL
INTRODUCTION TO ENGINEERING DESIGN

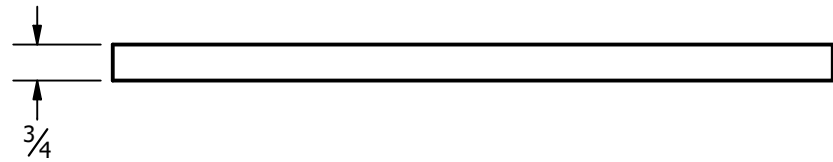
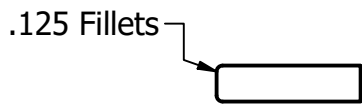
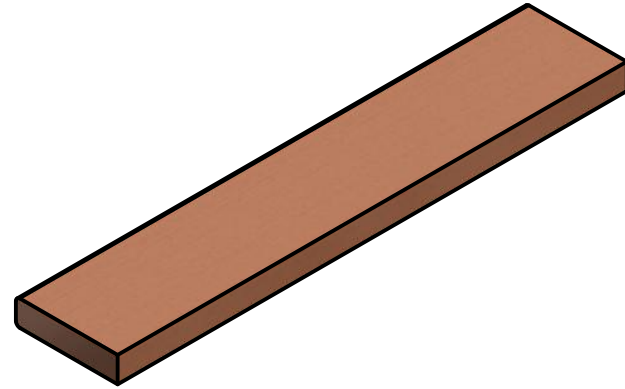
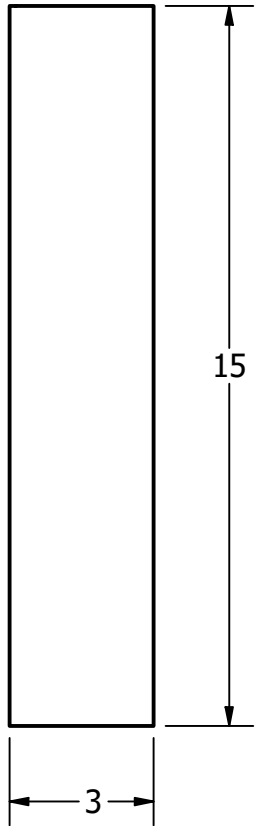
SCALE	
DATE	11/22/2010


HOUR	
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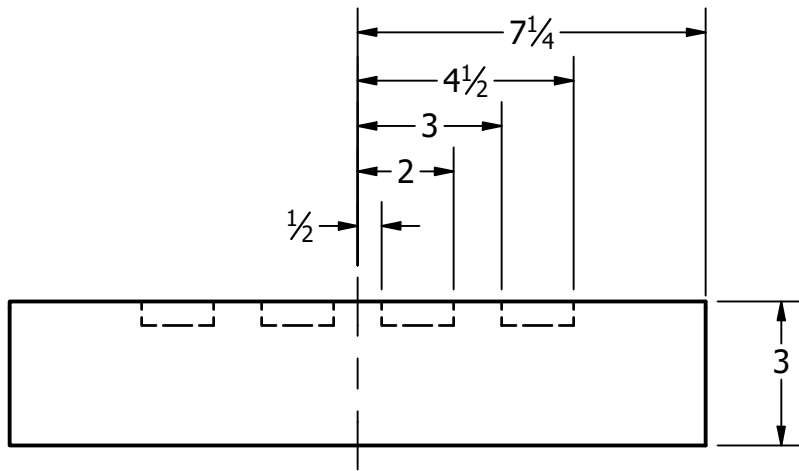
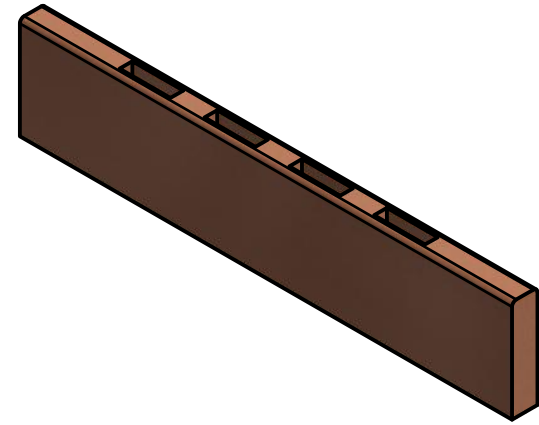
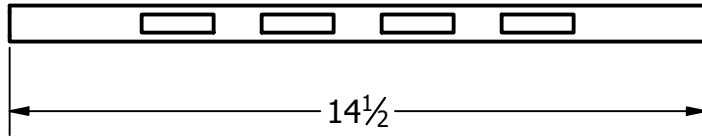


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AUTHOR	Mr. Warning	INTRODUCTION TO ENGINEERING DESIGN	DATE 11/22/2010	5 OF 8	

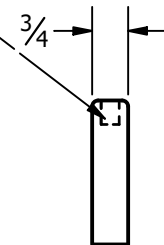



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AUTHOR	Mr. Warning	INTRODUCTION TO ENGINEERING DESIGN	DATE 11/22/2010	6 OF 8	

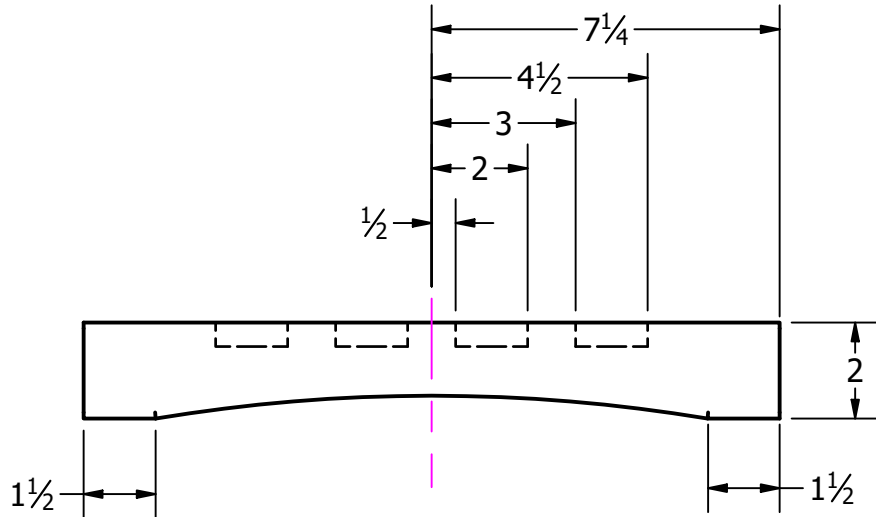
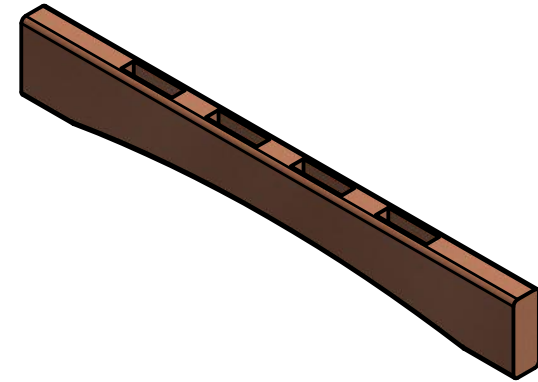
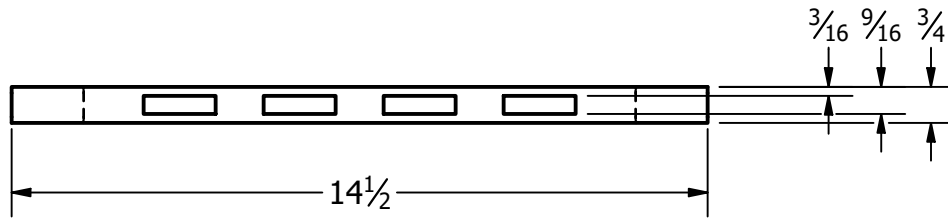





All Mortised Holes are 1/2" deep

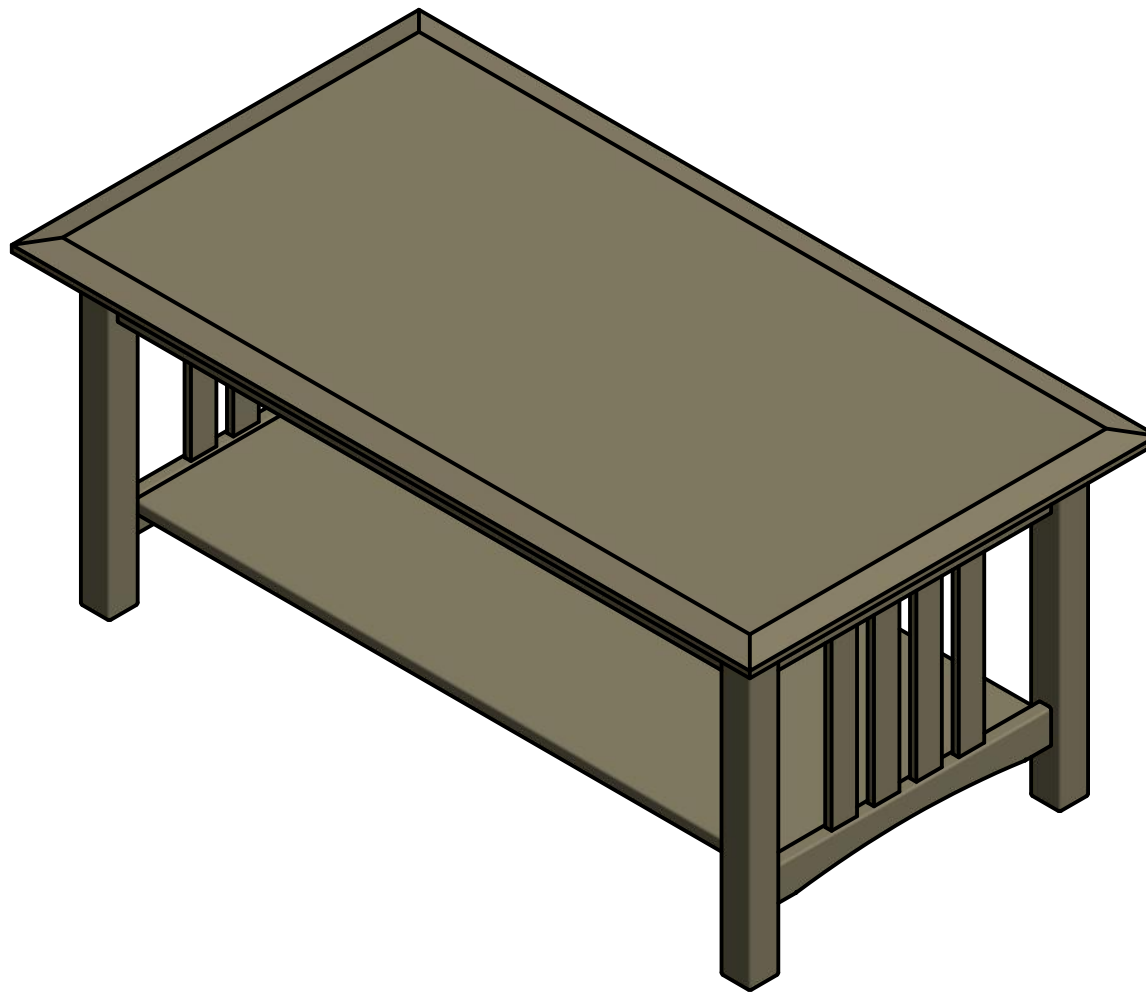



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AUTHOR	Mr. W.	INTRODUCTION TO ENGINEERING DESIGN	DATE 11/22/2010	7 OF 8	

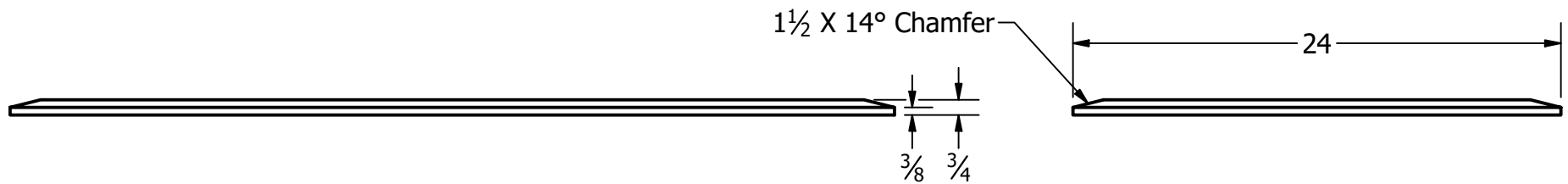
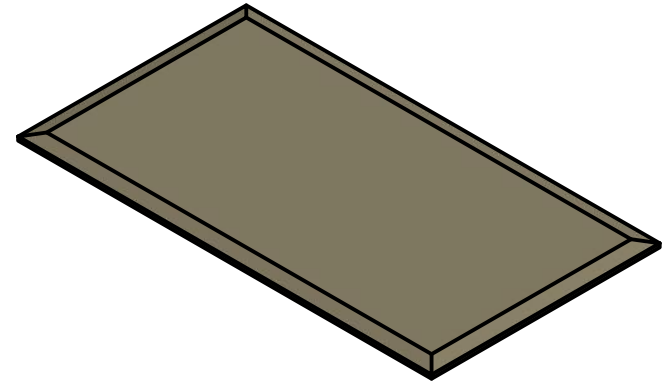
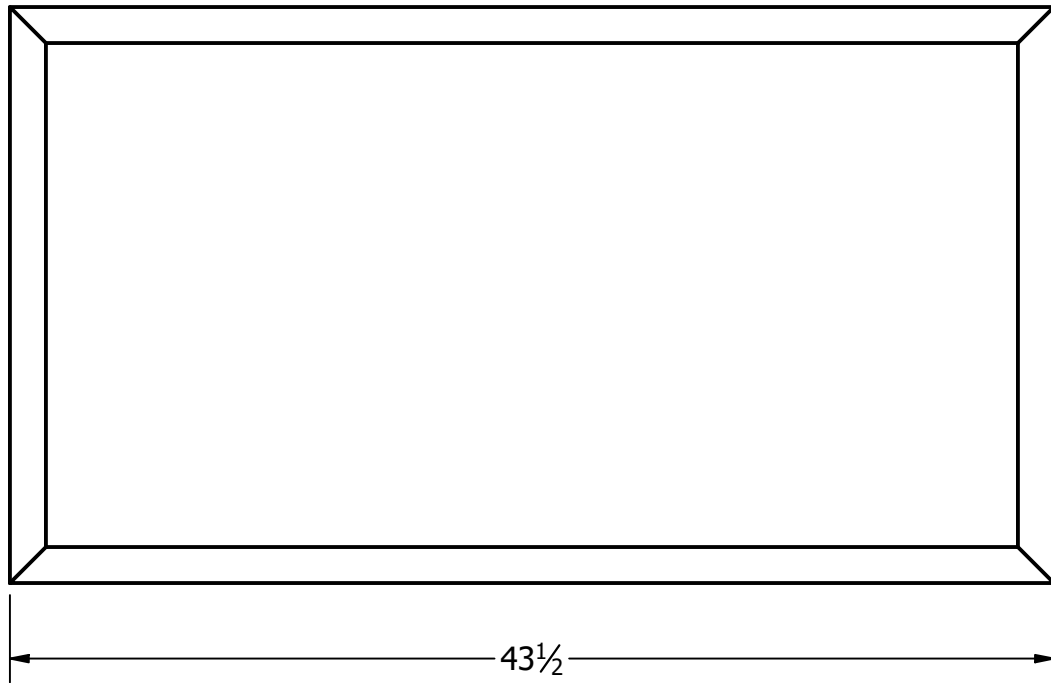



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AUTHOR	Mr. W.	INTRODUCTION TO ENGINEERING DESIGN	DATE 11/22/2010	8 OF 8	

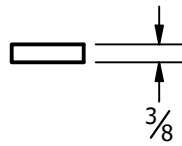
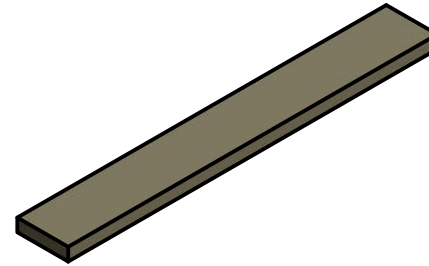
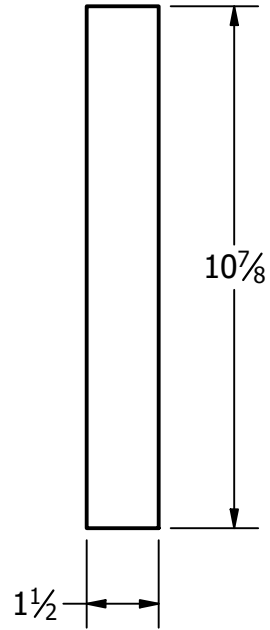





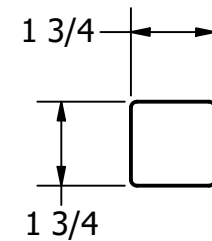
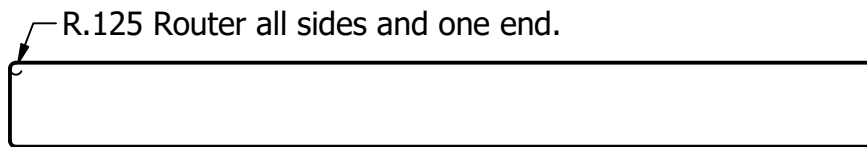
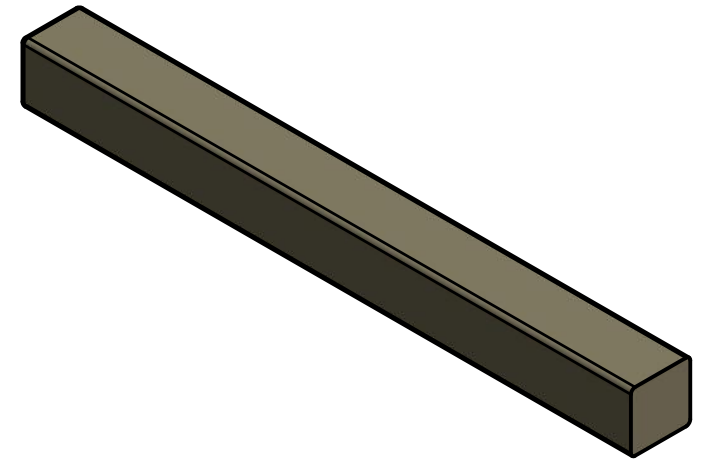
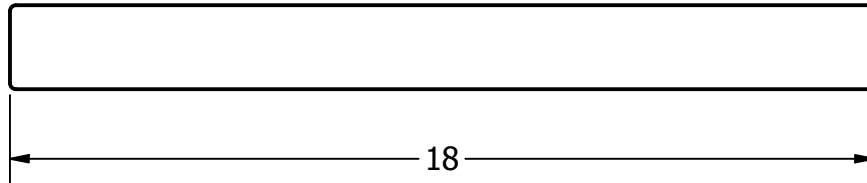
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AUTHOR		INTRODUCTION TO ENGINEERING DESIGN	DATE 1/30/2012	1 OF 8	




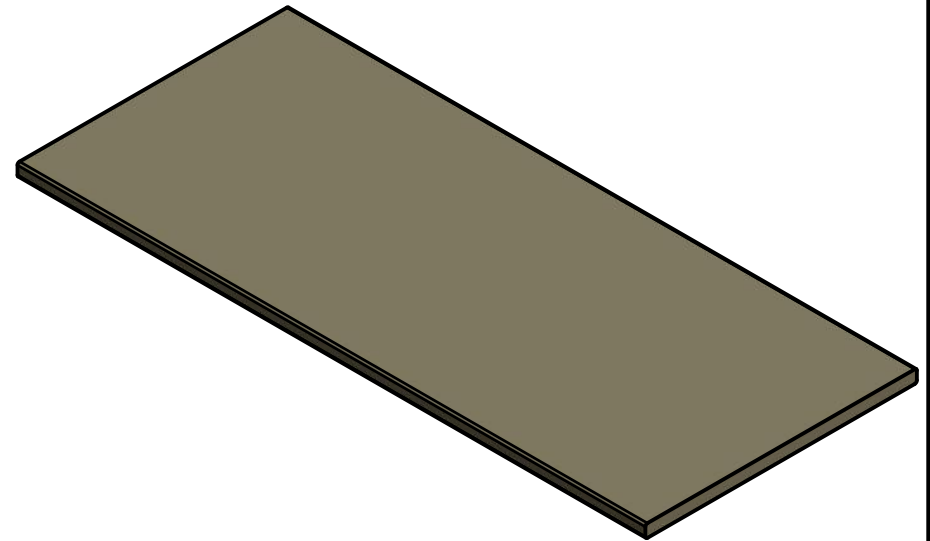
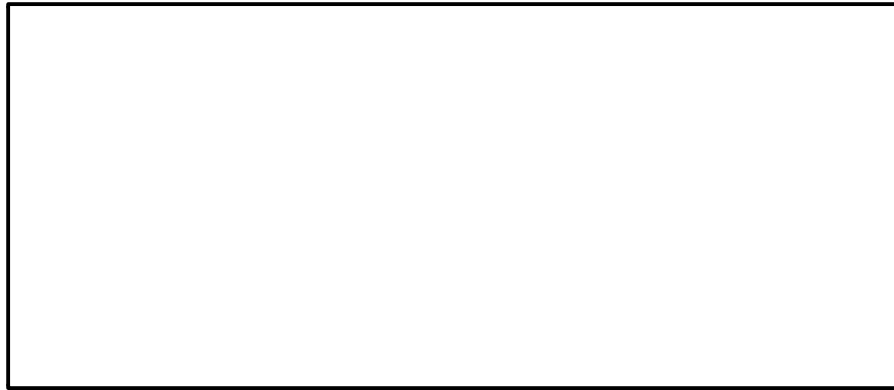
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AUTHOR	Mr. Warning	INTRODUCTION TO ENGINEERING DESIGN	DATE 1/30/2012	2 OF 8	



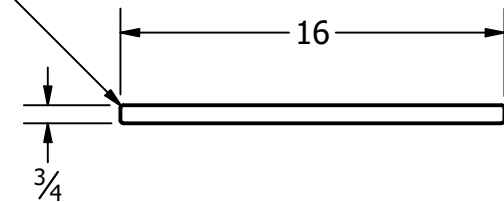
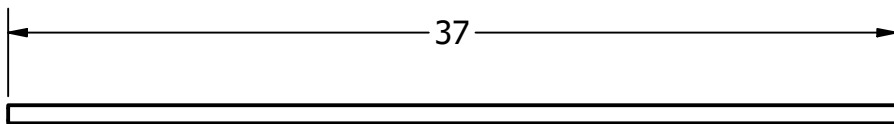
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AUTHOR	Mr. Warning	INTRODUCTION TO ENGINEERING DESIGN	DATE 1/30/2012	3 OF 8	




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AUTHOR	Mr. Warning	INTRODUCTION TO ENGINEERING DESIGN	DATE 1/30/2012	4 OF 8	

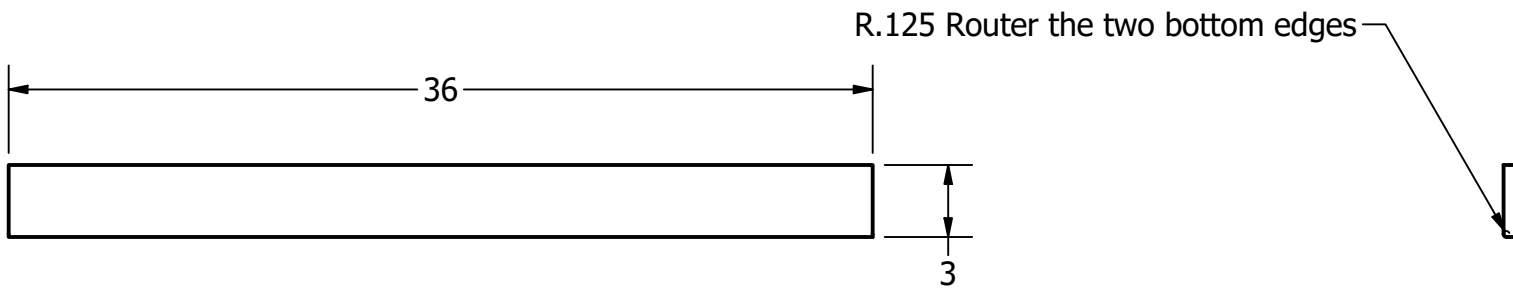
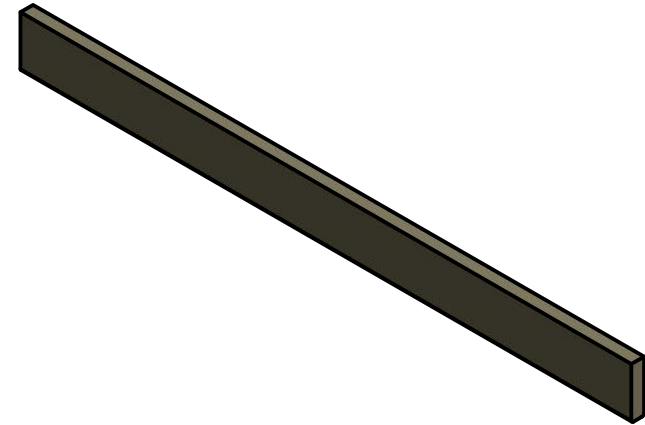
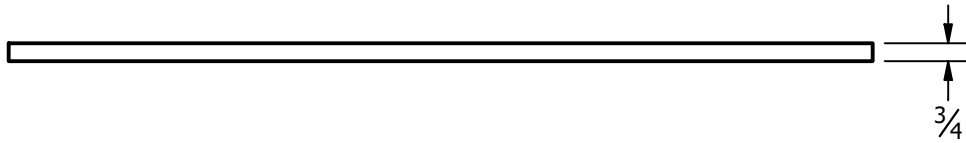


R.125 Router the top and bottom of the edges.



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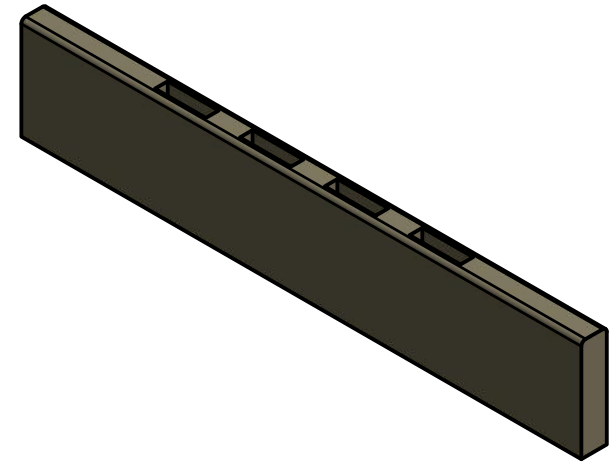
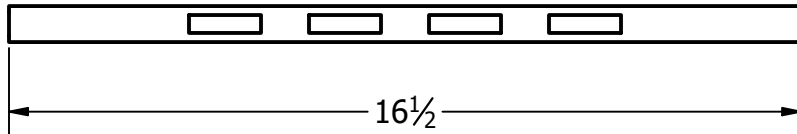
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AUTHOR	

BONDUEL HIGH SCHOOL
INTRODUCTION TO ENGINEERING DESIGN

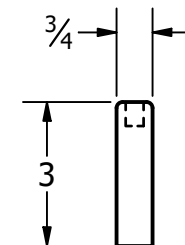
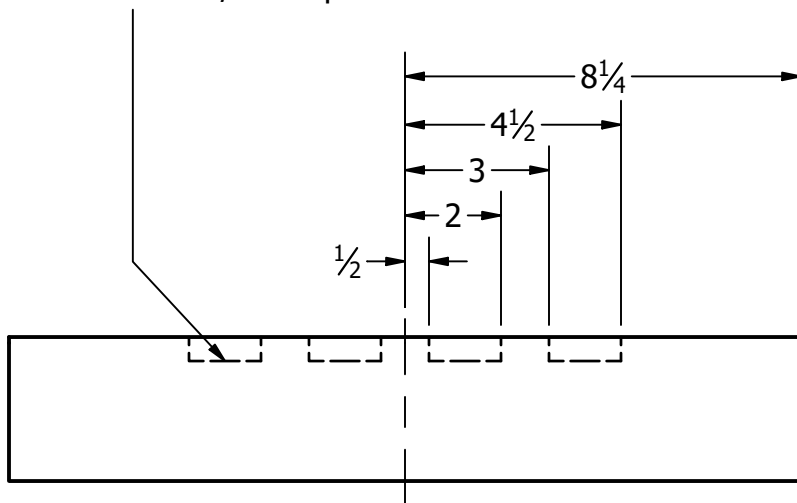
SCALE	
DATE	1/30/2012


HOUR	
	6 OF 8

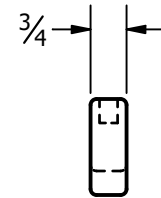
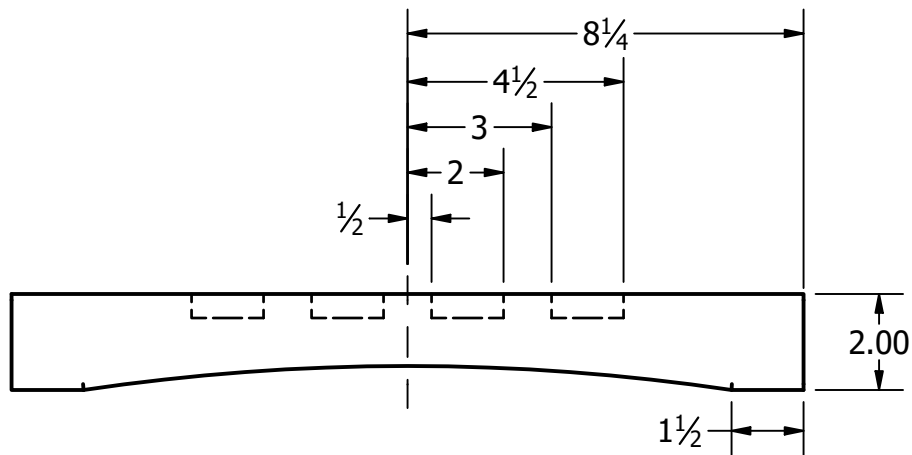
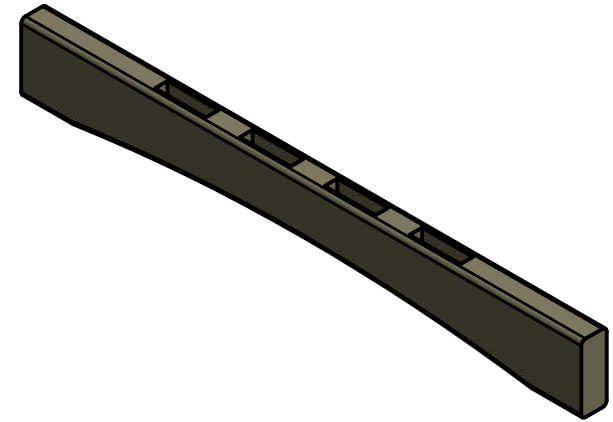
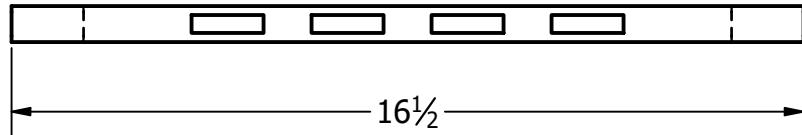





All mortised holes are 1/2" deep.



TITLE	Upper End Rail	BONDUEL HIGH SCHOOL	SCALE	HOUR	
AUTHOR	Mr. Warning	INTRODUCTION TO ENGINEERING DESIGN	DATE 1/30/2012	7 OF 8	



TITLE	Lower End Rail	BONDUEL HIGH SCHOOL	SCALE	HOUR	
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## Materials and Processes Individual Parts Evaluation

**Directions:** Students are to measure each individual piece of lumber that is used to make the entire project. You must measure the Thickness, Width, and Length.

For every sixteenth of an inch that you are off, you must deduct one point.

Please record your measurements and points deductions below.

**Quick Example:** If a piece is supposed to be  $\frac{3}{4}$ " x 2" x 16", and you have  $\frac{3}{4}$ " x 1  $\frac{15}{16}$ " x 16", you would have 1 point to deduct for that individual part.

<u>Part</u>	<u>Thickness</u>	<u>Width</u>	<u>Length</u>	<u>Points Lost</u>	<u>Total Points</u>
Legs	1. 2. 3. 4.	1. 2. 3. 4.	1. 2. 3. 4.		____/40pts
Top					____/30pts
Bottom Shelf					____/10pts
Slats					____/8pts
Upper Rails	1. 2.	1. 2.	1. 2.		____/10pts
Upper End Rails	1. 2.	1. 2.	1. 2.		____/20pts
Lower End Rails	1. 2.	1. 2.	1. 2.		____/30pts

## Materials and Processes Plan of Procedures Scoring Rubric

<b><u>Grading Criteria</u></b>	<b><u>Description of what is going to be graded</u></b>	<b><u>Points Possible</u></b>	<b><u>Points Earned</u></b>
<b><u>Kreg Jig Procedures</u></b>	All pocket holes are in the correct location/s. There are no extra pocket holes. If there are 1 or 2 extra holes or holes in the wrong place students must give themselves a 95%, anything more than that will be a 92%.	10	
<b><u>No Glue, Mill, Burn Marks</u></b>	If students followed all directions with gluing and sanding procedures, they will have earned all points possible. If any one of the three is visible, a 95 % will be earned, more than 3 of these defects will earn you at best a 90%.	15	
<b><u>Table Top</u></b>	Student has followed all correct instructions for constructing their table top. Student has put a biscuit joint 4" in from each end and if the student has built a coffee table, they should have put one in the middle someplace as well. The table top should not have any crown to the top. If the top is not flat, the student will have earned at best a 95%. If the top is uneven on either the bottom or top, the student will have earned at best a 92%	20	
<b><u>Bottom Shelf</u></b>	Bottom shelf should have the grain going in the direction that would be considered the length of the shelf. If this is not correct, this is an automatic 90%. If you have done this correctly, you should give yourself a 100%	10	
<b><u>Lower End Rails Arc</u></b>	Students will need to have created an arc on the lower end rail piece. This arc must start and finish 1 ½" from each end with an arc height of ½" in the center of the piece. If these measurements are not accurate, a 90% is the best that can be earned.	20	

<b><u>Routing Procedures</u></b>	All of the following pieces must be routed in the proper locations upper side rails along the bottom edge, upper end rails along the bottom edge, lower end rails along the top and bottom edges, bottom shelf along the top and bottom edges and all edges and one end of the legs. The routed edge should be uniform along all edges. If there are any uneven edges students must deduct some points for this.	20	
<b><u>Mortising Procedures</u></b>	All mortised holes have been drilled approximately $\frac{1}{2}$ " deep. Correctly hole layout is critical. Holes should be spaced out evenly as well as being centered along the edge of each rail. To check to see if they have been centered, you can measure the distance from one end to the first hole, that distance must be the same from the opposite end.	20	
<b><u>Staining Procedures</u></b>	Stain was applied with a rag and was put on the all surfaces of every part evenly. No excess stain was visible and none of the parts were sticky or tacky prior to spraying Lacquer on to each piece.	15	
<b><u>Spraying Lacquer</u></b>	At minimum of two coats of Lacquer were sprayed on the entire projects. In between each coat of Lacquer, every part was scuffed with the 3M Super Fine sanding pad. The table top must have a minimum of 3 coats of Lacquer sprayed on. If this has been done as written the student shall receive full credit	15	
<b><u>Proper Assembly</u></b>	Used correct length of screws to put entire project together. Therefore no screws are popping through anywhere and there are no extra screw holes visible.	10	
<b><u>Project is Square</u></b>	After the entire table has been assembled. Students should be able to set the table on the classroom floor; the table should sit flat on the floor. If the table wobbles back and forth, this means that your table is not square. If your table is not sitting flat on the floor, you must deduct 5 points for this.	30	
<b><u>Final Project Appearance</u></b>	Give yourself the grade you think you deserve on your project.	50	

## Materials and Processes Plan of Procedures Scoring Rubric

<u>Grading Criteria</u>	<u>Description of what is going to be graded</u>	<u>Points Possible</u>	<u>Points Earned</u>
<u>Title Page</u>	Student including a picture of their table and a title of the project that has been built on the front of their Plan of Procedure	5	
<u>Table of Contents</u>	Full table of contents with page numbers that match the rest of the plan of procedures.	5	
<u>Page Numbers</u>	Every page is numbered and matches the table of contents, except for the title page.	5	
<u>Pictures of each part</u>	Every part built to make the table must have an individual picture of that specific part.	10	
<u>Title Page for each part</u>	Each part must have a dedicated title page, all that should be included on this page is a picture of the part and the finish dimension of that part.	5	
<u>Picture of assembled project</u>	Must dedicate an entire page to your assembled project.	5	
<u>Squaring Procedures</u>	List the squaring steps that were used to create each part of the project.	10	
<u>Hand Drawn Multi-View Sketch</u>	All parts of the table must have a Multi-View sketch, must include a front-top-right side view of each part	20	
<u>Gluing Procedures</u>	List the gluing procedures that were used to create each part that was glued for the entire project.	10	
<u>Explanation of Building Parts</u>	Fully explain how you built each individual part of your table in specific "chapters" throughout the plan of procedures.	60	
<u>Danish Oil Procedures</u>	Must explain the step by step procedures that you did when it came to putting Danish Oil on your project.	15	
<u>Assembling Procedures</u>	Fully explain "ALL" steps to assemble your completed project.	50	

# Materials and Processes

## Plan of Procedures Checklist

**Directions:** Students, take a look at this checklist to see if you have the necessary topics within your Plan of Procedure to achieve the highest grade possible.

- Title Page
- Table of Contents
- Page Numbers
- Hand drawn multi-view sketches of each part
- Digital picture of created parts
- Title Page for each part
- Picture of assembled project
- Squaring Procedures
- Gluing Procedures
- All Building of Parts
- Staining Procedures
- Assembling Procedures